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All sorts of fantastic and fearsome ideas have attached to comets, from early historical times to near the close of the nineteenth century. The writer remembers clearly that his neighbors of thirty years ago considered comets to be messengers of disaster. The greatest comet of the nineteenth century, DONATI'S of 1858, was the accredited forerunner of our Civil War. Medieval representations of comets as flaming swords were common.

In HOMER'S "Iliad" XIX, 381, we read:—

> "Like the red star, that from his flaming hair
> Shakes down disease, pestilence and war."

From EVELYN'S Diary of 1624:—

> " . . . the effect of that comet, 1618, still working in the prodigious revolutions now beginning in Europe, especially in Germany."

From MILTON'S "Paradise Lost," II, 708-711:—

> " . . . and like a comet burn'd,
> That fires the length of Ophiuchus huge
> In th' Arctic sky, and from his horrid hair
> Shakes pestilence and war."

Not the least of the services of science to civilization has been the gradual emancipation of humanity from all fear of comets.

Astronomers will welcome the coming of Halley's Comet, full of hope that the photo-dry-plate, the spectroscope, and other ways and means of attack invented since its last visit in 1835 will enable them to remove something of the mystery of comets, the most mysterious of all celestial bodies.

PLANETARY PHENOMENA FOR NOVEMBER AND DECEMBER, 1909.

By MALCOLM MCNEILL.

PHASES OF THE MOON, PACIFIC TIME.

Last Quarter..	Nov. 4,	$1^h\ 38^m$ P.M.	Last Quarter..	Dec. 4,	$8^h\ 12^m$ A.M.
Full Moon ...	" 12,	6 18 P.M.	Full Moon ...	" 12,	11 59 A.M.
First Quarter..	" 20,	9 29 A.M.	First Quarter..	" 19,	6 18 P.M.
New Moon ...	" 27,	12 51 A.M.	New Moon ...	" 26,	1 30 P.M.

There will be a total eclipse of the Moon on the night of November 26th-27th. The entire eclipse will be visible throughout the United States. The principal events of the eclipse occur as follows, Pacific time:—

Moon enters shadow	Nov. 26	11^{h}	11^{m}	P.M.
Total eclipse begins	“ 27	12	14	A.M.
Middle of the eclipse	“ 27	12	55	A.M.
Total eclipse ends	“ 27	1	36	A.M.
Moon leaves shadow	“ 27	2	38	A.M.

There will be a partial eclipse of the Sun on the afternoon of December 12th. No part of the eclipse will be visible in the United States, as the eclipse track is confined to the region near the South Pole. Southern Australia, New Zealand, and Tasmania will have a few minutes of partial eclipse.

The Sun reaches the winter solstice, its greatest distance south, December 22d, 3 A.M., Pacific time.

The Earth is in perihelion just after the close of the year on January 1st, 3 A.M., Pacific time.

Mercury on November 1st has just passed greatest west elongation, and is a morning star, rising about an hour and a half before sunrise, and the interval remains as great as an hour until near the middle of the month. It will be in good position for observation in the morning twilight for the first ten days of November. It passes superior conjunction and becomes an evening star on December 2d. By the end of the month it has moved far enough away from the Sun so that it can be seen in the evening twilight, and on December 31st it sets about an hour and a quarter after sunset.

Venus is an evening star, setting on November 1st about two and a quarter hours after sunset. This interval increases rapidly, and by the end of December it is more than three and one half hours. The planet reaches its greatest east elongation on December 2d, and its apparent distance from the Sun is then 47° 18′. It moves 62° eastward and 11° northward through *Sagittarius* and *Capricorn*. Toward the close of December it will have attained nearly its maximum brightness, and may be seen in the full daylight with the naked eye.

Mars is still in fine position for observation, not setting until nearly 3 A.M. on November 1st and nearly 1 A.M. on December 31st. It again took up its eastward motion at the end of October, and during November and December will move 19° eastward and 11° northward in the constellation *Pisces*. By

December 14th it will have reached the line at which it began its westward motion on August 23d, but it will be about 6° north of its August position. Its distance from the Earth in millions of miles increases from 49 on November 1st to 92 on December 31st, being on that date distant from us just a little less than the Earth's mean distance from the Sun. On November 1st its brightness is only a little more than half of its opposition brightness, and it will lose light rapidly, so that on December 31st it will be only one fourth as bright as it was on November 1st and only about one ninth as bright as it was at opposition. It will, however, still be conspicuous. Throughout the period *Mars* and *Saturn* will be in the same quarter of the heavens. On November 1st *Saturn* will be about 21° east of *Mars*. The more rapid motion of *Mars* will cause this distance to diminish to 13° by December 1st, and the two planets will come into conjunction on December 31st, *Mars* passing 3° 12′ north of *Saturn*.

Jupiter rises about 3:30 A.M. on November 1st and at about 12:30 A.M. on December 31st. It moves about 8° eastward and 4° southward in the western part of the constellation *Virgo* toward the first magnitude star *Spica*, α *Virginis*, and at the close of the period is 7° west and 6° north of the star.

Saturn is still in fine position for evening observation, remaining above the horizon until nearly 5 A.M. on November 1st and until after 12:30 A.M. on December 31st. It retrogrades, moves westward, until December 20th not quite 2°, and then moves eastward. It is in the constellation *Pisces*. Its conjunction with *Mars* on December 31st has already been noticed. As seen in the telescope the rings will appear to close up a little toward the end of the year.

Uranus is gradually being overtaken by the *Sun*, but may be seen in the southwestern sky in the evening. It moves about 3° eastward in the constellation *Sagittarius*. No bright star is near, but the planet comes to conjunction with *Venus* on November 23d, the latter being 2° 33′ south, and with *Mercury* on December 28th, the latter being 1° 44′ south.

Neptune is in *Gemini*; rises about 9:30 P.M. on November 1st and at about 5:30 on December 31st.

(SIXTY-SEVENTH) AWARD OF THE DONOHOE COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded in duplicate to Mr. Zaccheus Daniel, of Princeton, New Jersey, for the discovery of an unexpected comet on June 15, 1909, and to M. A. Borrelly, of Marseilles, France, for the discovery of the same comet on June 14, 1909.

It was Mr. Daniel's notice of discovery, with observed position, which was first communicated to the astronomers of this and other countries by cable and telegraph.

W. W. Campbell,
Sidney D. Townley,
Heber D. Curtis,
Committee on the Comet-Medal.

San Francisco, Cal., October 8, 1909.